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EUPONERA GILVA (ROGER), A RARE NORTH AMERICAN ANT.

By W. M. Wheeler and F. M. Gaige,
Bussey Institution, Harvard University and University of Michigan.

In 1863 Julius Roger described, among other North American Formicidæ, *Ponera gilva* and *Discothyrea testacea*, two species which the senior author has vainly sought for the past twenty years, both in the field and in the numerous collections sent him for identification. "Nordamerika" was the only locality appended to the descriptions, and as the other species of the two genera are tropical or subtropical it was natural to infer that Roger's types were taken somewhere in Mexico. The *Discothyrea* is still to be rediscovered, but recently the junior author succeeded in taking four workers of *gilva* in northwestern Tennessee.

In his most recent revision of the Ponerinæ (1910) Emery refers this species to the subgenus *Trachymesopus* of the genus *Euponera*. He divides the species of the subgenus into three groups: those with small, but developed eyes in the worker (*stigma* group), those with very minute, vestigial eyes in the same caste (*ochracea* group), and those known only from female specimens (*darwini* group). The first group comprises several species of which the best-known, *E. stigma* Fabr., is common throughout tropical America and even has a variety, *quadridentata* Smith, in the Indomalayan and Papuan Regions. The typical form of the species occurs also in Florida, since Father J. Schmitt many years ago gave the senior author a worker captured at Fort Worth. To the *ochracea* group Emery assigns three species: *gilva* Roger, *ochracea* Mayr of the Mediterranean Region (according to Forel with a subspecies, *guatemalensis*, in Guatemala!) and *sauteri* Wheeler of Japan. To the group known only from female specimens two species are assigned: *darwini* Forel, which occurs in Northern Australia, India, Indonesia, Madagascar and the Congo, and *crassicornis* Emery from New

Guinea. Since workers of *darwini* var. *indica* Emery, recently received by the senior author from the Philippines, have minute, vestigial eyes, this species must be transferred to the *ochracea* group.

The yellow or ferruginous coloration of both females and workers and the minute eyes of the latter in all the species of the *ochracea* group show that these ants must lead a concealed, hypogæic existence. The females of some of the species, notably of *ochracea* and *darwini*, are known to fly to lights and are therefore more frequently taken than the workers. But *gilva* must be either extremely rare or extremely local or its female would have turned up in some of the many collections made since 1863. It would seem to be, in fact, an ancient relict on the verge of extinction. Its discovery in Tennessee, a region in which other interesting animal and plant relicts have survived, is not without significance. Since there is a *Trachymesopus succinea* Mayr, in the Baltic Amber, the subgenus goes back at least to the Lower Oligocene, but as only female specimens of this species are known it is impossible to say whether it bebelongs to the *stigma* or *ochracea* group.

Emery in his admirable paper on the North American ants, published in 1895, states that he has seen two worker cotypes of *gilva* from the Berlin Museum and besides adding somewhat to Roger's description, gives an excellent figure of the thorax. A more detailed description, with a figure (Fig. 1) of the head, body and middle leg, is appended.

Euponera (Trachymesopus) gilva (Roger).

Pondera gilva Roger, Berlin. Ent. Zeitschr. 5, 1863, p. 170 ☿; Mayr, Verh. zool. bot. Ges. Wien, 36, 1886, p. 438 ☿; Dalla Torre, Catal. Hymen. 7, 1893, p. 39 ☿; Emery, Zool. Jahrb. Abth. Syst. 8, 1895, p. 266, pl. 8, fig. 10 ☿; Wheeler, Ants, etc., 1910, p. 561 ☿.

Pachycondyla (*Pseudoponera*) *gilva* Emery, Ann. Soc. Ent. Belg. 45, 1901, p. 46 ☿.

Euponera (*Trachymesopus*) *gilva* Emery, Genera Insect. Ponerinæ, 1910, p. 86 ☿.

Worker. Length 3–3.4 mm. Head shaped as in *Ponera coarctata*, slightly longer than broad, somewhat broader behind than in front, with feebly convex sides and nearly straight posterior border.

Eyes very small, distinctly larger, however, than in *E. ochracea*, *sauteri* or *darwini*, at the anterior sixth of the sides of the head. Mandibles rather convex, with 6–7 distinct teeth, the apical somewhat coarser than the basal. Clypeus short, high and carinate in the middle, especially behind, depressed on the sides, with broadly rounded, entire anterior border. Frontal carinæ small, flattened, together forming a cordiform plate, divided by a narrow, impressed, longitudinal line, which runs back onto the head as far as the vertex in the form of a frontal groove. Antennal scapes not reaching the posterior border of the head by a distance somewhat greater than their greatest diameter; funiculi slender at the base and enlarged at the tip, all the joints, except the first and last distinctly broader than long; last joint nearly as long as the three preceding, which are subequal and form with it an indistinct club. Pronotum as long as broad, somewhat depressed above, with bluntly submarginate sides. Promesonotal and mesoëpinotal sutures pronounced, the mesonotum transversely elliptical, as high as the pronotum and feebly convex in profile. Epinotum shorter and narrower than the pro- and mesonotum together, laterally compressed at the base, broader behind, its dorsal outline in profile nearly straight, horizontal, lower than the mesonotum, longer than the declivity into which it passes rather abruptly, the latter feebly concave, distinctly marginate on the sides. Petiole from above transversely elliptical, a little broader than the posterior part of the epinotum, the node in profile broad below, a little lower than the epinotum, narrowing upward, with very feebly concave, steeply sloping anterior, flat, vertical posterior and evenly rounded dorsal surface; the ventral surface with a low, rounded projection in the middle. Postpetiole truncated in front, as long as, but distinctly narrower than the first gastric segment. Remaining segments rather small; sting well-developed, curved. Legs stout; middle tibiæ and metatarsi short and strongly bristly on their extensor surfaces.

Mandibles smooth, shining, with a few sparse punctures, mainly near the apical borders and some indistinct striæ near the base. Head opaque, very finely and densely punctate, so that it has a velvety texture. Thorax less opaque, especially the epinotum, and the fine punctures, especially of the latter, not so dense. Sides of epinotum, petiole, gester and legs shining, with very fine and still more distinctly separated punctures.

Hairs and pubescence golden yellow, both poorly developed on the head, more abundant on the body and legs; the hairs erect, rather fine, moderately long, the pubescence long and rather coarse, not very closely appressed.

Ferruginous; legs and antennæ scarcely paler; head and mandibles a little darker, in some specimens with the occiput slightly infuscated.

Redescribed from four specimens taken August 30, 1919 by the junior author near Camden, Tennessee. The specimens were found four miles west of the town on a rather dry hillside covered with an open forest of second growth oak. The trees were small and so scattered that there was a ground cover of short wiry dry grass under them, with a few small shrubs and bushes. There was very little ground débris, as the natives seem to keep such picked up for firewood, but under a small stick, perhaps two feet long and three inches wide at its greatest width all four of the ants were found. The stick had evidently been lying in one position for a long time, as it was slightly buried, so that it came up with difficulty and disturbed the earth in loosening. The ants were in the soil beneath the stick, close together, but no evidence of a nest was seen. They were very sluggish and slow-moving, even more so than a few specimens of *Stigmatomma pallipes* Haldem, which were found in the same habitat. They made no effort to escape, seemed dazed and confused by the sudden disturbance, and one of them when picked up with the forceps and placed in the palm of the hand, feigned death for several seconds, with the antennæ drawn close to the head and the legs held tightly against the body.

NOTE ON PTERERGATES IN THE CALIFORNIAN HARVESTER ANT.

By Harlow Shapley,
Mount Wilson Observatory, Pasadena, California.

The phenomenon of vestigial wings in worker ants that otherwise are normal is of interest because of its significance in the problem of the origin of social castes among the Formicidæ, and also because of its infrequent occurrence. The recorded captures of workers with wing-vestiges are very few. Wheeler has taken three pterergates in New York from a colony of *Myrmica scabrinodis* var.; Keys found one of the same species in England (figured in Donisthorpe's *British Ants*, p. 41). Wheeler has also taken a large worker with vestigial wings from a colony of *Cryptocerus aztecus* in Mexico, and Bondroit found at Landelies in Belgium one pterergate of the species *Lasius flavus*.

One of the most common ants in Pasadena at the present time is the large red harvester, *Pogonomyrmex californicus* Buckley, but apparently it is being exterminated by *Iridomyrmex humilis* Mayr, the rapidly spreading Argentine ant. From one of the small embattled nests of *P. californicus* which has been under observation since March, 1919, I sent a few specimens to Professor Wheeler, who called my attention to the presence of three pterergates. Further investigation has shown that of all the workers of this nest seen during 1919 one-half has vestigial wings, varying in degree of development from small chitinous nodules on the mesothorax to membranous structures one to two millimeters in length. Except for these organs representing wings, there is no conspicuous difference in thoracic structure, or otherwise, between the pterergates and the remainder of the workers.

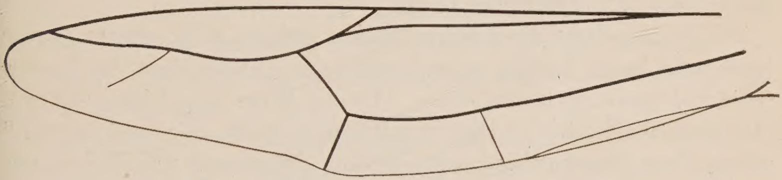

Fig. 1. Vestigial anterior wing of a worker of *Pogonomyrmex californicus* Buckley.

The vestiges observed in all six of the pterergates mentioned in the first paragraph are on the mesothorax, and indicate the abnormal development of anterior wings. There is also but a single pair of vestiges for sixteen of the pterergates of *P. californicus* so far examined.

One individual from this nest, however, is unique, not only in having vestiges both of anterior and of posterior wings, but also in possessing one anterior wing that is membranous and veined. A diagram of the venation of this most developed wing, which resembles more closely that of a normal hind wing, is given in the accompanying figure. At the time of capture the pterergate was beset by a half dozen Argentine ants; it is quite possible, therefore, that the other anterior wing had been pulled off in the course of this last fight or during previous activities.

SIBERIAN ANOPHELES.

By C. S. Ludlow,
Army Medical Museum, Washington, D. C.

The collections of mosquitos sent by the Surgeons of the American Expeditionary Force in Siberia, have been of much interest because of the new forms they contained, and the specimens have usually been in excellent condition, so that it has been comparatively easy to differentiate them.

While there have been some smaller species as a rule the forms have been large, heavily scaled, and more hirsute than the species from the more southern areas. Among these new forms are two *Anopheles* belonging to the *maculipennis* group, *i. e.* with spotted wings, very closely allied, yet showing differences which, because the Siberian forms are not well known, it seems desirable to consider specific, and both are described below.

Anopheles lewisi sp. nov.

Female. Head light brown with a median bunch of white forked and lanceolate scales, and long slender white scales on the vertex projecting forward, brown forked scales on the occiput and sides, light bristles on the vertex, brown ones around the eyes; antennæ dark brown, basal joint brown with a few flat brown scales, verticels brown, scanty, and short, the pubescence is white; proboscis brown, labellæ brown; palpi brown, the proximal joint heavily brown scaled, the following not so dark and the scales appressed, short brown hairs on the ultimate and penultimate joints and a few at the apex of the antepenultimate; clypeus light brown, pruinose; eyes dark.

Thorax; prothoracic lobes light brown, covered with light to brown bristles; mesonotum has broad greyish median stripe reaching from the nape to the scutellum, immediately laterad a broad dark brown stripe extending from the scutellum cephalad about one-half the length of the mesonotum, the lateral portions a soft brown shading gradually into the lighter pleura. In the greyish stripe are two narrow raised lines running from the nape caudad about one-half its length and dividing it into three nearly equal parts. The greyish stripe is heavily covered with fine golden brown (almost yellow) hairs through which the two lines show more or less distinctly often giving the effect of three definite stripes of the golden scales, but this does not appear clearly on all the specimens; the short brown stripes are nude, and the softer brown lateral portions are covered much more diffusely than the median greyish stripe. There is a brown median spot just cephalad of the scutellum; golden brown bristles on the lateral margin and heavy dark brown bristles over the wing joint. The scutellum follows closely the coloring of the mesonotum, with fine golden hairs, and dark brown border bristles; pleura light brown shading to the yellow of the coxæ, covered with a silvery tomentum and having a few small bunches of long light hairs; metanotum light brown, pruinose.

Abdomen brown, with broad light basal bands in the integument, all well covered with long golden hairs, venter mostly light but with some narrow apical brown bands. The abdomen as a whole is so markedly hairy as to resemble that of a male.

Legs: coxæ light, in some specimens a definite yellow, with some light hairs, trochanters follow the general coloring of the coxæ, with some white and some brown long flat scales and hairs; femora covered with brown scales having a tendency to greenish or bronze reflections, ventrally almost white to near the apex, a narrow light knee spot; tibiæ darker, the apex very narrowly light; the tarsal joints are all dark, but the scales are so sensitive to the direction of the light, that at one moment they may be brown, and in another light are at once almost white. Ungues all large and simple.

Wings clear, heavily clothed with long brown scales, somewhat truncate on the costa, the proximal part of the first long, and the stem of the fifth long vein, but otherwise the scales are very long lanceolate scales. The membrane is slightly infuscated at the spots which are made by aggregations of the scales and occur at the forks of the first submarginal, and second posterior cells, at the cross-veins and at the root of the second long vein. The first submarginal cell is about a third longer than the second posterior, its stem about one-half the length of the cell; basal cross-vein about its own length from the anterior. The fringe is brown, and has the same golden brown reflections that characterize the other wing scales. At times this is so marked as to be rather deceptive even suggesting small fringe-spots, which I think are entirely the result of the reflections. The halteres have a light stem and dark knob.

Length about 10.5 mm. (body 7 mm., proboscis 3.5 mm., wing 6 mm.).

Male. The coloring is much as in the female; antennæ white, with very narrow brown bands at the joints, verticels brown with golden reflections, terminal joints brown, pilose; the basal joint large, brown, with a few minute hairs; palpi with dark brown scales, heavily clubbed, the terminal joint with some, and the preceding joint with heavy tufts of long brown hairs, both the hairs and the scales turning to golden-brown with changing light. Thorax more sparsely scaled, but the dark lines showing plainly; abdomen more definitely banded and very hairy. Legs much as in female, but the fifth fore tarsal has on the ventral aspect very short and heavy scales or bristles, one hardly knows what to call them, they are so very stout and short, arranged as an inverted V the broad part at the proximal end of the joint. The ungues are very uneven, the larger bi-serrated, the small one very short and heavy, and the joint itself is markedly curved; the heavy bi-serrated claw, the strong short bristles, and the curved joint making an unusually strong combination. Mid ungues large and simple, hind ungues small and simple. Wings more sparsely scaled, the infuscation at the spots showing plainly.

Length about 10 mm. (body about 7 mm., proboscis 3 mm., wing 6 mm.).

Taken July 10–22, at Selenga, and Verkhne Udinsk, Siberia.

Described from eight females and fourteen males collected by the surgeons on duty at these stations. It is a very large and fuzzy-looking Anopheline, resembling a single specimen received from Fort Gibbon, Tanana, Alaska, which, however, was in much too bad condition to place.

There are also with this species some much darker specimens, that may be a new species, a variety, or merely an accidental variation, but is described below.

Anopheles selengensis sp. nov.

Female. Head black, with a median depression, and on either side are white forked and lanceolate scales forming a well marked bunch, long white scales and bristles on the vertex, projecting forward, some smaller dark forked scales at the sides and the margin of the occiput. Antennæ black, basal joint black shiny bearing a few small flat upright scales, verticels dark, short, and scanty, pubescence white and plentiful; proboscis black, labellæ a lighter brown; palpi dark brown, with outstanding scales at the base, the remainder appressed scales; clypeus dark brown pruinose; eyes black.

Thorax: prothoracic lobes well separated, scantily covered with small light hairs and dark bristles; mesonotum bluish grey and dark brown, practically black. The grey median broad stripe is pruinose, with a very narrow median brown line extending from the nape almost to the scutellum, where it widens to form the "bare space," and rather ill-defined submedian broader brown lines extending about one-half the way to the scutellum. Laterad to this grey stripe, extending about half the length of the mesonotum, from the scutellum, is, on either side a very dark brown, or black, club-like stripe, and on the lateral parts the integument is very dark, shading into the lighter pleura. The specimen is partly denuded but the scales which are fine yellow hairs and have apparently been thickly placed, are lacking on the dark club-like parts, are diffuse on the laterad portions, a row of longer hairs and very dark brown bristles on the lateral margins, well marked over the wing joint; scutellum dark but rather toward the grey, a few yellow hairs, and many dark marginal and submarginal bristles; pleura dark, somewhat lighter than the darker parts of the mesonotum, and show a few bunches of hairs and black bristles; metanotum dark, pruinose.

Abdomen almost black, well covered with yellow hairs and long yellow bristles, venter dark.

Legs all dark except a light ventral line on the femora and tibiæ. The knee spot if present is reduced to a single row of scales. Ungues all simple.

Wings clear, slightly infuscated at the spots, which occur at the forks of the second and fourth long veins, at the root of the second, and at the cross-veins. The first submarginal is longer and a little narrower than the second posterior, its stem about one-half the length of the cell. The basal cross-vein not quite its length from the anterior. The scales are dark brown, somewhat truncate on the costa, the first long vein and the stem of the fifth, otherwise they are long narrow lanceolate. Halteres have light stem and dark knobs.

Length (abdomen 4 mm., body 7 mm., proboscis 3 mm., wing 6 mm.).

Taken, Selenga, Siberia, July 10, 1919, by First Lieut. J. P. Kopecky, M.C., U. S. Army (A. E. F.–S.) and described from two females sent with specimens of *Anopheles lewisi*, described above. It is quite in the possibilities that this may prove to be only a variation, of *lewisi*, but as the Anophelines of this region are not well known it has seemed worth while to describe it.

NOTES AND DESCRIPTIONS OF SPECIES OF TELENOMUS HAVING TEN-JOINTED ANTENNÆ (HYMENOPTERA; SCELIONIDÆ)

By A. M. Wilcox,[1]
Gipsy Moth Assistant, U. S. Bureau of Entomology.

While working over a collection of Proctotrypoid parasites during the winter of 1918–19, I found many specimens of Telenomus with the females having only ten antennal joints. These were separated into three species.

The following two species appear to be new to science and their descriptions are herewith presented. In the form of the abdomen they resemble Phanurus but the head is transverse and not quadrate or subquadrate as typical of that genus. They are, therefore, placed in Telenomus.

Telenomus hemerocampæ sp. nov.

Female. Length 1.25 mm. Black, shining; the legs, except the coxæ, dusky yellow, upper sides of femora slightly darker, especially the posterior pair; wings hyaline, ciliated; head about three times as wide as thick as seen from above. Ocelli in a curved line, the lateral ones nearly touching the margin of the eyes, the median

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[1] The writer desires to express his thanks to Prof. C. T. Brues of the Bussey Institution, Harvard University, for his valuable assistance in the preparation of this paper, for the loan of specimens and for the examination and comparison of the species treated.

one set in a shallow fovea. Head margined behind. Vertex shagreened; front below shining, smooth except for a single row of minute punctures along the inner margin of the eyes and a shagreened area on the sides below. The row of punctures extends along the vertex behind the median ocelli and are somewhat larger than those on the sides. Mandibles dark reddish brown. Antennæ ten-jointed with a five-jointed club, scape and pedicel dusky yellow, funicular joints pale brown, the club darker. Scape reaching to the vertex, pedicel twice as long as thick at the apex; first funicular joint twice as long as thick, slightly thicker than the pedicel; second shorter, two-thirds as long; third one-half as long as the first and rounded; first four joints of the club quadrate, about equal; last slightly longer and conically pointed. Prothorax about as long as wide, convex in front, thinly covered with whitish pubescence, shagreened. Scutellum shining with fine, sparse punctures which show faintly. Postscutellum finely rugose. Abdomen sessile, longer than the head and thorax, pointed at the tip. First segment wider at the sides than medially, longitudinally striated at the base; second segment fully twice as long as wide, shining and striated at the base near suture, these striæ not being as long as those at the base of the first segment. Behind these striæ are faint aciculations, showing somewhat stronger at the sides. Following segments much shorter. Wings hyaline, ciliated; venation pale yellow.

Male. Differs from the female as follows: Legs and antennæ paler. Antennæ twelve-jointed; scape and pedicel yellowish; the flagellar joints fuscous becoming darker towards the tip. Pedicel and first three funicular joints longer than thick, about equal in length; fourth to ninth moniliform; the last joint twice as long as the penultimate, pointed.

Type locality. New Hampshire. Type: Gip. Moth Lab. No. 4176E. Deposited in U. S. Nat. Mus. Type Cat. No. 23066, U. S. Nat. Mus. Host: *Hemerocampa leucostigma* Abb. & Sm.

Described from four specimens reared from the eggs of *H. leucostigma* collected April 14, 1910.

Telenomus euproctidis sp. nov.

Female. Length 0.75 mm. Black, shining; the legs brownish; wings hyaline with long cilia. Head about three times as wide as thick as seen from above. Lateral ocelli nearly touching the eyes, the median one set in a shallow fovea. Vertex shagreened, with a few punctures; front below smooth, shining, with a row of punctures along the sides near the eyes, shagreened on the sides below. Antennæ dark brown or black, ten-jointed, with a four-jointed club. Scape nearly reaching to the vertex; pedicel more than twice as long as thick; first funicular joint two-thirds as long as the pedicel, second and third one-half as long as the first, not as thick, about equal, fourth considerably wider than long; first, second, and third club joints nearly quadrate, about equal, the last longer and conically pointed. Thorax about as long as wide, convex in front, thinly pubescent with whitish hairs, faintly shagreened. Scutellum smooth, shining, finely pitted around the outer edge; postscutellum finely rugose. Abdomen smooth, shining, longer than the thorax; first segment considerably wider at tip than at base, rather deeply, longitudinally striated at base, striæ a little longer than one-half the length of the segment. Second segment more than twice as long as wide, striated at base, the striæ not as deep as those on first segment but slightly longer; following segments short and coming to a point. Wings hyaline with rather long cilia; venation pale yellowish brown.

Male. Differs from the female as follows: antennæ and legs, except coxæ, considerably paler; abdomen not pointed at apex. First three funicular joints of antennæ about two-thirds the length of the pedicel; fourth to ninth shorter, moniliform; the last twice as long as wide and pointed.

Type locality: Japan. Type: Gip. Moth Lab. No. 3348A. Deposited in U. S. Nat. Mus. Type: Cat. No. 23067, U. S. Nat. Mus. Host: *Euproctis conspersa* Butl.

Described from several specimens reared from the eggs of *E. conspersa* from Japan, August 25, 1910.

Telenomus dalmani (Ratz.).

Ichneum. der Forstinsect., vol. 1, p. 185 (1844), (Teleas).
Mayr, Verh. zool.—bot. Gesellsch. Wien, vol. 29, p. 708 (1879).
Telenomus fiskei Brues, Psyche, vol. 17, p. 106 (1910).

There are a few specimens of this species from Dresden, Germany, in the collection and many others from New England. The specimens from New England were first determined as *Telenomus fiskei*

Brues[3] but later were found to agree with Mayr's description of *T. dalmani*. The type of *T. fiskei* agrees with the description and when compared with specimens of *T. dalmani* was found to be the same. Prof. C. T. Brues, who has gone over the description and compared the specimens, is also of the opinion that *T. fiskei* and *T. dalmani* are the same species.

This species has been taken in Maine, New Hampshire, Massachusetts, New York, Ottawa, Canada, England, Holland and Germany. It has been reared from the eggs of Notolophus antiqua and Hemerocampa leucostigma in U. S. Crawford records this species as having been reared from the eggs of Orgyia antiqua in England, Holland and Ottawa, Canada.

Telenomus abnormis Crawford.

Proc. U. S. Nat. Mus., vol. 41, p. 270 (1911).

I have not seen this species. It is described as having the second segment about as long as wide. It differs in this character from any other species under consideration in this paper.

The females in this group may be separated with the following table:

1. Antennal club five-jointed 3
   Antennal club four-jointed 2
2. Second segment of abdomen about as long as wide *abnormis*, Craw.
   Second segment of abdomen much longer than wide *euproctidis* sp. nov.
3. Abdomen truncate at apex . . . . *dalmani* (Ratz.)
   Abdomen pointed at apex . . . . *hemerocampæ* sp. nov.

THE NOCTUID GENUS COPABLEPHARON (HARVEY) WITH NOTES ON ITS TAXONOMIC RELATIONSHIPS.

By E. H. Strickland,
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The Genus Copablepharon was erected by Harvey ('78) for a single Californian species, *absidum* Harv. which he had previously ('74) placed in the genus Ablepharon-Arsilonche. In his description he states that the genus is related to Arsilonche in that the eyes are lashless and naked, and to Ommatostola in the ornamentations and habits of the moth. It differs from either, however, in the possession of spinose tibiæ. Both of these supposedly related genera have been placed in the sub-family Acronyctinæ by Hampson ('16).

Four species of moths were included in this genus when Smith published his list of American Lepidoptera in 1903, and he placed it next to the genus Nycterophæta, in the cuculliid group of the undivided family "Noctuidæ." This allocation of Copablepharon was accepted, with slight modifications, by taxonomists until Hampson ('03) transferred it to the sub-family Agrotinæ on account of its spined tibiæ. Barnes and McDunnough ('17) follow Hampson's classification in their check list, and this is the generally accepted standard for American Lepidopterists.

The six species now included in Copablepharon are apparently confined in their distribution to Western America. They are nowhere very common, and nothing has been published upon the immature stages of any species.

In the spring of 1913 larvæ of *C. longipennis* Grt. and *C. grandis* Strk. were taken in Manitoba and Alberta respectively. Mr. N. Criddle, who found the *longipennis* larvæ, and bred from them a single adult, states that the larvæ were typical "cutworms." Unfortunately Mr. Criddle did not examine the pupal stage, which was passed in an earthen cell below ground.

On May 9 a single larva of *C. grandis* was taken in a stubble field at Monarch, Alberta.

This larva resembled superficially a lightly pigmented specimen of *Euxoa ochrogaster* Gn. (The Red-Backed Cutworm). *Grandis*, however, differs from *ochrogaster* in that the median and lateral lines are white instead of brown. In all of the larvæ of Euxoa, and of closely related genera, that we have examined tubercle II is considerably larger than tubercle I (see diagram). In the larva of *grandis*, and also in specimens, now inflated, which Mr. Criddle collected at the same time as, and believes to be identical with, the specimen from which he bred *longipennis* this tubercle is no larger than is tubercle I.

The larva of *grandis* evidently hibernates when about half grown since the specimen taken on May 9 in Alberta was in the fourth stage. This larva was found below ground, among other cutworms, and in captivity it fed freely on alfalfa and to some extent on barley.

When mature the larva measured 1½ inches in length, and by July 5 it had pupated in an earthen cell similar in construction and size to that of the species of Euxoa, though it was somewhat distorted internally.

Thus it will be seen that Copablepharon larvæ are typically Agrotine in their habits, and were it not for the minute tubercle II their structure also would be in harmony with that of typical members of this sub-family.

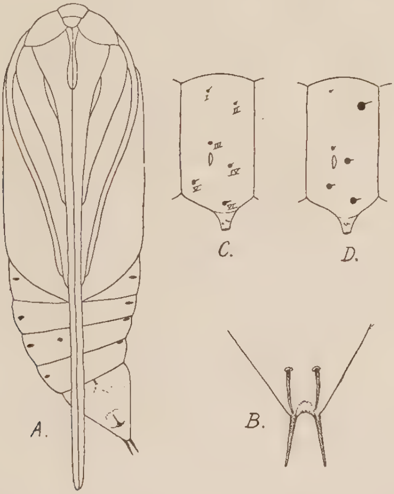

Fig. 1. *A*. Pupa of *C. grandis*, x 3; *B*. Cremaster of pupa, dorsal aspect, x 12; *C*. Diagram of larval tubercles based on abdominal segment IV of *C. grandis; D*. Diagram of larval tubercles of typical Euxoa species based on abdominal segment IV of *Chorizagrotis thanatologia* Dyar.

The pupa, of which an illustration is given, is remarkable in that the proboscis sheath is so elongated that it extends beyond the apex of the abdomen. The pupa itself is 19 mm. long and the proboscis sheath, of which 8 mm. is free, extends 2 mm. beyond the cremaster.

The only other Noctuid pupæ which we know to have an extended proboscis sheath are those of certain genera of the Cuculliinæ, and to a less extent the Plusiinæ.

Mosher ('16) in her classification of Lepidopterous pupæ states that in the Cuculliinæ the wings and maxillæ (proboscis sheath) never extend beyond the caudal margin of the fourth abdominal segment. This statement is apparently based entirely upon observations made on two specimens of the same genus, Graptolitha Hbn. Humphreys ('43) figures the pupæ of several British species of the genus Cucullia in all of which the proboscis is extended well beyond segment IV. Lintner ('69), in describing the pupa of the American species *Cucullia intermedia* Say, states that the free end of the tongue case projects 5/100 inch beyond the wing cases, and the pupa is 7/10 inch long. We have examined empty pupa-cases of this species which confirm this statement and indicate that in the living pupa the free apex of the proboscis sheath extends beyond the margin of the fifth abdominal segment.

We have insufficient data upon the cremaster of Cuculliid pupæ for drawing definite conclusions therefrom, but the cremaster of *intermedia* certainly bears no resemblance to *Copablepharon grandis* in which latter species it appears to be identical with the type found in the commonest Agrotinæ, such as the numerous species of Euxoa. This consists of two stout terminal spines, which vary considerably as to form and divergence within the species, together with two supernumerary dorsal bristles, one or both of which may be absent.

The eggs of *C. grandis* are sub-globular. The upper surface is shallowly rugose, and the under side is smooth. In captivity they were laid in the soil, and were greenish-white when deposited.

With the exception of the spined tibiæ the adults, which have long narrow primaries, show greater affinities to the Cuculliinæ than they do to the Agrotinæ. From the appearance and habits of the larvæ, and from the pupal cremaster, however, it would seem that this genus is rightly placed in the latter sub-family despite the superficial resemblance of the pupa and adult to those of some genera in the Cuculliinæ.

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AN INSECT AND LACK OF ENTOMOLOGICAL KNOWLEDGE AN IMMEDIATE CAUSE OF THE WORLD WAR.

By M. T. Smulyan,
U. S. Bureau of Entomology, Melrose Highlands, Mass.

> "What dire offence from amorous causes springs,
> What mighty contests rise from trivial things!"
>
> —Pope.

Those familiar with the beliefs of the ancient Greeks doubtless recall the highly fascinating bit of tradition dealing with Peleus and Thetis and the events which grew out of their marriage; how Peleus, King of Thessaly, wooed and finally overcame the scruples of the divine Thetis; how that mortal, in order to please his bride, invited the gods of Olympus to attend the nuptial rites and festivities on Mount Pelion; how the vindictive Discordia, previously expelled from heaven for sowing dissension and stirring up strife, in revenge, for not having been included among those invited, threw an apple in their midst, with the inscription, "To the most beautiful"; how this aroused the envy and jealousy of the proud and powerful divinities, Juno, Venus, and Minerva; how the dispute was carried for arbitrament to the shepherd Paris, son of Priam, King of Troy; how Paris decided in favor of Venus who offered the most tempting bribe, that of the fairest woman as wife; how later, with the assistance of the goddess, he contrived to visit the court of Menelaus, King of Sparta, husband of Helen; how the base prince then, violating all laws of hospitality and honor, carried the beautiful Helen away to Troy; and, finally, how all Greece rose to avenge the insult and the wrong.

Thus did a mere *apple* cause that mighty commotion, the Trojan War.

Historians and others interested in tracing the cause and origin of the late war, the great human convulsion of modern times, appear to be generally agreed that the fundamental causes are to be found in pre-war Germany's need for expansion, in the pressure of democratic ideas upon her autocratic régime, in the doctrine of the Superman and the ambition for world conquest, in the rivalry for trade routes and world trade, etc., etc., and that the conflict was precipitated by Austro-Serbian friction and, directly, by the assassination of the Austrian archduke. But alas for our limited human understanding! Our historians and scholars have apparently completely overlooked one of the most important and immediate facts in the chain of causation, namely, the fatal activities of an *insect*—an object infinitely more mischievous if far more insignificant and less attractive than Discordia's apple—a parasite (species unfortunately not known). I am unable to state at the present moment how this extremely important discovery came to be made or through what channels the intelligence reached this country; whether it is to the credit of some able press correspondent, or whether it is due to the Red Cross or American Medical Mission. The fact is inseparably bound up with a most pathetic occurrence—as pathetic as its effects were far-reaching and terrible—of which the following is the briefest outline: In a village in the interior of Serbia there lived a maiden who was loved passionately by a youth of the same village. But while she apparently accepted his, her own love, strange as it may seem, focused upon a beautiful, little, caged bird which she possessed and which she prized above all things. In the course of time, however, an insect parasite attacked the bird and killed it. The gentle girl, affected to the depths of her inmost being by the loss, developed fever and after a short illness died. The ardent youth, her lover, half-crazed by the event, rushed away from the village, the scene of his tragic misfortune, and out into the world. Some time later, in another part of the country, he became a member of an extreme patriotic-revolutionary organization and very shortly afterwards, at Sarajevo, assassinated Archduke Franz Ferdinand of Austria. The last, as is known, led to Austria's ultimatum to Serbia and to the war.

The conclusion (or lesson) is, of course, clear. Had there been sufficient entomological knowledge in that Serbian town to diagnose the bird's malady and to devise proper remedial measures, the world war with all its attendant horrors might have been averted.

PROCEEDINGS OF THE CAMBRIDGE ENTOMOLOGICAL CLUB.

At the meeting April 13, 1920 a paper was read by S. M Dohanian on the mosquito control of which he had charge at the army flying station near San Antonio, Texas. By filling holes and frequent oiling of all open water around the camp, it was kept almost free from mosquitoes. Discussion followed on the effect of petroleum on plants and several cases were mentioned where water plants grew through a thick film of oil without apparent injury.

R. Heber Howe, Jr., spoke of the Odonata in New England and showed maps on which the distribution of each species is plotted and his lately completed Manual of New England Odonata which contains illustrations of the distinctive characters of the species and pictorial tables explaining their classification.

Mr. Varás, a student in Boston, gave an account of the physiography and faunal conditions of Chile, his native country.

Two meetings were held in May on the 11th and 25th. W. M. Wheeler gave an account of the feeding habits of ants, especially of the larvæ of Pseudomyrminæ which have on the ventral side within easy reach of the mouth a pouch in which the worker ants deposit the waste pellets from their mouth. The mouths of the larvæ are provided with a triturating apparatus for chewing this food and appear to get their whole nourishment from it. A full account of this will be published in the Transactions of the American Philosophical Society.

D. J. Caffrey of the U. S. Bureau of Entomology gave an account of recent studies of the European corn-borer in America for which see recent bulletins of the U. S. Dept. of Agriculture and N. Y. State Dept. of Farms and Markets.

At the meeting of May 25 three recent publications by members of the Club were shown. Revision of the Nearctic Termites by Nathan Banks and T. E. Snyder in U. S. Nat. Museum Bulletin 108. Manual of the Orthoptera of New England by A. P. Morse in Proc. Boston Soc. Nat. History. Catalogue of the Spiders of Canada known to the year 1919 by J. H. Emerton in Trans. Canadian Institute, Toronto 1920.

C. A. Frost read a paper on the habits, distribution and systematic relations of several species of New England and Canadian

Coleoptera; H. C. Fall discussed Mr. Frost's paper and gave a brief account of his own recent studies of Coleoptera especially in the genera Hydrophorus and Gyrinus. C. W. Collins mentioned the finding at Winchester, Mass., after its disappearance for several years, the European *Carabus auratus* introduced there as a destroyer of the Gipsy Moth in 1908. He also noted the finding unexpectedly at Framingham of the European *Carabus granulatus.*

Notes on recent collecting were reported by several members and all agreed in noticing an increasing scarcity of insects of all kinds near all large centers of population.

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Wanted: To exchange, or purchase for cash, specimens of the Genus Apantesis from any locality. Also to purchase rare Catocalæ.—Samuel E. Cassino, Salem, Mass.

Wanted for cash: Lowest representatives of all families of insects, preserved in fluid.—G. C. Crampton, Amherst, Mass.

Wanted: Syrphidæ (Flower-flies) from all parts of the world. Exchanges solicited. Will determine on the usual conditions.—C. L. Metcalf, Ohio State University, Columbus, Ohio.

Largest Expanse—one each ♂ and ♀ Lepidoptera wanted for transfer purposes. Those not good enough for collections will do. Will buy, or exchange for local Lepidoptera, etc.—C. V. Blackburn, 12 Pine St., Stoneham, Mass.

Butterflies of Japan and Formosa, will be exchanged by S. Satake, 48 Aoyama-minamimachi 5-chome, Tokyo, Japan.

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For sale, or exchange for entomological items not in my library—American Entomologist, complete; Dyar, List of N. A. Lepidoptera; Redi, Experimenta, circa Generationem Insectorum, 1686; many others.—J. E. Hallinen, Cooperton, Okla.

Wanted: To examine, determine and exchange Cicadellidæ or "Jassidæ" from all parts of North America.—J. G. Sanders and D. M. DeLong, State Capitol, Harrisburg, Pa.

Cochineal Insects: Wish to obtain living specimens of cochineal scales. Will purchase or exchange as may be desired.—C. T. Brues, Bussey Institution, Boston 30, Mass.

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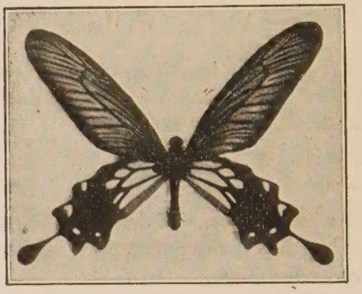

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